

Name: \_\_\_\_\_

## GCSE (1 – 9)

# Solving Equations

### Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

### Information

- The marks for each Question are shown in brackets  
– *use this as a guide as to how much time to spend on each Question.*

### Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1 Write a number in each box to make the calculation correct.

(i)  $7 + \boxed{5} = 12$  (1)

(ii)  $11 - \boxed{8} = 3$  (1)

(Total for Question 1 is 2 marks)

2 Solve  $x + 4 = 19$   
 $-4 \quad -4$

$x = 15$

$x = 15$

(Total for Question 2 is 1 mark)

3 Solve  $\frac{d}{2} = 9.5$   
 $\times 2 \quad \times 2$

$d = 19$

$d = 19$

(Total for Question 3 is 2 marks)

4 Solve  $\frac{7y}{7} = \frac{63}{7}$

$y = 9$

$y = 9$

(Total for Question 4 is 1 mark)

5 Solve  $5 - m = 12$   
 $+m \quad +m$

$5 = 12 + m$   
 $-12 \quad -12$   
 $-7 = m$

$m = -7$

(Total for Question 5 is 1 mark)

6 Solve  $\frac{5g}{5} = \frac{40}{5}$

$g = 8$

$g = 8$

(Total for Question 6 is 1 mark)

7 Solve  $4(a-3) = 22$

$$\begin{aligned}4a - 12 &= 22 \\+12 &+12 \\ \hline 4a &= 34 = \frac{17}{2} \\ \hline \frac{4a}{4} &= \frac{34}{4} = \frac{17}{2}\end{aligned}$$

$$a = \frac{17}{2}$$

(Total for Question 7 is 2 marks)

8 Solve  $5(x-6) = 65$

$$\begin{aligned}5x - 30 &= 65 \\5x &= 95 \\x &= 19\end{aligned}$$

$$x = 19$$

(Total for Question 8 is 2 marks)

9 Solve  $8(m-5) = 48$

$$\begin{aligned}8m - 40 &= 48 \\8m &= 88 \\m &= 11\end{aligned}$$

$$m = 11$$

(Total for Question 9 is 2 marks)

10 (a) Solve  $x + 7 = 13$

$$x = 6$$

(1)

(b) Solve  $3h - 5 = 12$

$$\begin{aligned}3h &= 17 \\h &= \frac{17}{3}\end{aligned}$$

$$h = \frac{17}{3}$$

(2)

(Total for Question 10 is 3 marks)

11 (a) Solve  $x + x + x = 42$

$$3x = 42$$

$$x = \underline{14} \quad (1)$$

(b) Solve  $\frac{y}{3} = 4$

$$y = \underline{12} \quad (1)$$

(c) Solve  $2a - 5 = 19$

$$2a = 24$$

$$a = 12$$

$$x = \underline{12} \quad (1)$$

(Total for Question 11 is 3 marks)

12 Solve  $3(b - 5) = 27$

$$3b - 15 = 27$$

$$3b = 42$$

$$b = 14$$

$$b = \underline{14}$$

(Total for Question 12 is 2 marks)

13 (a) Solve  $\frac{2x}{3} = 6$

$$2x = 18$$

$$x = 9$$

$$x = \underline{9} \quad (2)$$

(b) Solve  $2(n + 5) = 15$

$$2n + 10 = 15$$

$$2n = 5$$

$$n = \underline{\frac{5}{2}} \quad (2)$$

(Total for Question 13 is 3 marks)

14 (a) Solve  $a + a + a + a = 24$

$$\frac{4a}{4} = \frac{24}{4}$$
$$a = 6$$

$a = 6$  (1)

(b) Solve  $b - 3 = 4$   
 $+3 +3$

$$b = 7$$

$b = 7$  (1)

(c) Solve  $4c + 6 = 18$   
 $-6 -6$

$$\frac{4c}{4} = \frac{12}{4}$$
$$c = 3$$

$c = 3$  (2)

(Total for Question 14 is 4 marks)

15 (a) Solve  $4a = 20$   
 $\frac{4a}{4} = \frac{20}{4}$

$$a = 5$$

$a = 5$  (1)

(b) Solve  $3y + 9 = 24$   
 $-9 -9$

$$\frac{3y}{3} = \frac{15}{3}$$
$$y = 5$$

$y = 5$  (2)

(Total for Question 15 is 3 marks)

16 Solve  $\frac{y}{3} - 5 = 4$

$$+5 +5$$

$$\frac{y}{3} = 9$$

$$y = 27$$

$y = 27$

(Total for Question 16 is 2 marks)

17 (a) Solve  $3 = 9 - 4k$   
 $\quad +4k \quad +4k$

$$4k + 3 = 9$$

$$\quad -3 \quad -3$$

$$4k = 6$$

$$k = \frac{6}{4} = \frac{3}{2}$$

$$k = \frac{3}{2} \quad (2)$$

(b) Solve  $\frac{d+3}{4} = 5$

$$d + 3 = 20$$

$$\quad -3 \quad -3$$

$$d = 17$$

$$d = 17 \quad (2)$$

(Total for Question 17 is 4 marks)

18 (a) Solve  $6w = 4w + 9$   
 $\quad -4w \quad -4w$

$$2w = 9$$

$$w = \frac{9}{2}$$

$$w = \frac{9}{2} \quad (2)$$

(b) Solve  $3x + 8 = 2$

$$\quad -8 \quad -8$$

$$3x = -6$$

$$x = -2$$

$$x = -2 \quad (2)$$

(Total for Question 18 is 4 marks)

19 (a) Solve  $2p + 24 = 5p$   
 $\quad -2p \quad -2p$

$$\frac{24}{3} = \frac{3p}{3}$$

$$8 = p$$

$$p = 8 \quad (2)$$

(b) Solve  $24 = 4(2x - 5)$

$$24 = 8x - 20$$

$$44 = 8x$$

$$x = \frac{44}{8} = \frac{22}{4} = \frac{11}{2}$$

$$x = \frac{11}{2} \quad (2)$$

(Total for Question 19 is 4 marks)

20 Solve

$$\begin{aligned} 3x + 12 &= 5x + 4 \\ -3x \quad -3x & \\ \hline 12 &= 2x + 4 \\ -4 \quad -4 & \\ \hline 8 &= 2x \\ 4 &= x \end{aligned}$$

$$x = 4$$

(Total for Question 20 is 2 marks)

21 Solve

$$\begin{aligned} 2m - 20 &= 10 + 7m \\ -2m \quad -2m & \\ \hline -20 &= 10 + 5m \\ -10 \quad -10 & \\ \hline -30 &= 5m \\ \frac{-30}{5} &= m \\ m &= -6 \end{aligned}$$

$$m = -6$$

(Total for Question 21 is 2 marks)

22 Solve

$$\begin{aligned} 10 - 2s &= s - 8 \\ +2s \quad +2s & \\ \hline 10 &= 3s - 8 \\ +8 \quad +8 & \\ \hline 18 &= 3s \\ \frac{18}{3} &= \frac{3s}{3} \\ s &= 6 \end{aligned}$$

$$s = 6$$

(Total for Question 22 is 2 marks)

23 Solve

$$\begin{aligned} 6y + 11 &= 3y + 5 \\ -3y \quad -3y & \\ \hline 3y + 11 &= 5 \\ -11 \quad -11 & \\ \hline 3y &= -6 \\ \frac{3y}{3} &= \frac{-6}{3} \\ y &= -2 \end{aligned}$$

$$y = -2$$

(Total for Question 23 is 2 marks)

24 Solve

$$7y + 18 = 2y + 28$$

$$\begin{array}{r} -2y \\ 5y + 18 = 28 \end{array}$$

$$\begin{array}{r} -18 \\ 5y = 10 \end{array}$$

$$\frac{5y}{5} = \frac{10}{5}$$

$$y = 2$$

$$y = 2$$

(Total for Question 24 is 2 marks)

25 Solve

$$2x + 20 = 6x - 12$$

$$\begin{array}{r} -2x \\ 20 = 6x - 12 \end{array}$$

$$\begin{array}{r} +12 \\ 32 = 4x - 12 \end{array}$$

$$\frac{32}{4} = \frac{4x}{4}$$

$$8 = x$$

$$x = 8$$

(Total for Question 25 is 2 marks)

26 Solve

$$3x - 9 = x - 8$$

$$\begin{array}{r} -x \\ 2x - 9 = -8 \end{array}$$

$$\begin{array}{r} +9 \\ 2x = 1 \end{array}$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$x = \frac{1}{2}$$

(Total for Question 26 is 2 marks)

27 Solve

$$10t - 19 = 7t - 14$$

$$\begin{array}{r} -7t \\ 3t - 19 = -14 \end{array}$$

$$\begin{array}{r} +19 \\ 3t = 5 \end{array}$$

$$3t = 5$$

$$t = \frac{5}{3}$$

$$t = \frac{5}{3}$$

(Total for Question 27 is 2 marks)